

Bio-analytical assays

The thinXXS Microfluidic Construction Kit contains basic microfluidic processing components such as a pump slide and polymer slides for mixing and splitting as well as fluidic connections between slides. The kit has through the microBUILDER project been further expanded with new slides with new functionalities. Further, mixed technologies as developed and supplied by microBUILDER partners have substantially expanded the usefulness of this kit as a basis for development and testing of a variety of new bio-analytical systems.

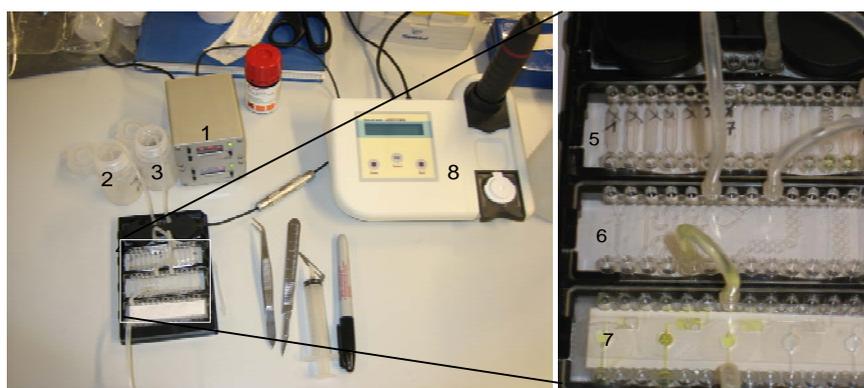
In the following is shown an example of how elements and mixed technologies, as developed by different partners through the microBUILDER project, fit together creating a useful toolbox for testing and designing bioassays into microfluidic systems.

Three different slides of the Microfluidic Construction kit as supplied by thinXXS were combined: Snake mixer slide, Cuvette slide and Reagent slide of which the two last were designed within the microBUILDER project.

A dry reagent formulation of an active enzyme, Alkaline Phosphatase (ALP), was prepared by HSG-IMIT and deposited in the reagent storage slide.

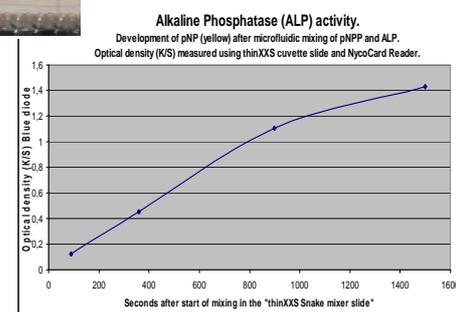
Anti-binding treatments of the mixer- and cuvette slides, as well as the experimental set up were performed by SINTEF.

Measurement of optical density is widely used in bio-analytical applications such as in many clinical chemical assays and a variety of enzyme immunoassay (EIAs and ELISAs). Alkaline Phosphatase (ALP) is an enzyme used in a variety of assays as it can transfer colorless substrates into a yellow product. In this experiment the usefulness of precise colour measurement as made possible by the new microBUILDER technologies is demonstrated.



Microfluidic setup including the reagent storage slide, the snake mixer slide and the cuvette slide.

Results from color measurements (optical density)



In conclusion the experimental set up using three slides in fluidic series and the results obtained show that the mixed technologies and the elements as developed by different partners within the microBUILDER consortium allow for transferring for example typical microtitre plate based assays into microfluidic designs.

Contributing partners



SINTEF

HSG



IMIT

thinXXS
MICROTECHNOLOGY